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ABSTRACT

A study examined the relationship between communication apprehension (CA) and student achievement among elementary and middle school students. It was hypothesized that students high in CA would demonstrate lower academic achievement than students moderate in CA who, in turn, would demonstrate lower levels of achievement than students low in CA. Subjects, 1,290 elementary and middle school students in a midwest state, completed the Measure of Elementary Communication Apprehension (MECA). Academic Achievement was determined from scores on the Stanford Early Achievement Test for kindergarten subjects, the Metropolitan Readiness Test for subjects in grade 1, and the Stanford Achievement Test for subjects in grades 2-8. Since students across grade levels completed three different achievement tests, separate statistical tests were conducted. The results provided partial support for the hypothesis. The hypothesis was not supported for students in kindergarten and grade 1. Analyses of mathematics and reading achievement test scores for students in grades 2-8 provided support for the hypothesis. The findings did not support the contention that students high in CA achieve at levels comparable to those of students moderate in CA, but did suggest that students low in CA achieve at levels comparable to students moderate in CA. (HTH)

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COMMUNICATION APPREHENSION AND ACADEMIC ACHIEVEMENT AMONG ELEMENTARY AND MIDDLE-SCHOOL STUDENTS

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COMMUNICATION APPREHENSION AND ACADEMIC ACHIEVEMENT AMONG ELEMENTARY AND MIDDLE SCHOOL STUDENTS

Since 1971, a number of research projects (Bashore, 1971; McCroskey & Andersen, 1976; Garrison, Seiler & Boohar, 1977; Scott & Wheeless, 1977; Scott, Wheless, Yates & Randolph, 1977; Davis & Scott, 1978; Powers & Smythe, 1980) have examined the consequences of communication apprehension (CA) on student learning. The academic achievement of the high communication apprehensive student, compared to that of the low communication apprehensive student, is expected to be significantly lower because he/she will avoid classroom communications with teacher and peers--to avoid experiencing the negative feelings he/she has learned to associate with past communicative attempts with such target persons--when such communications may be necessary to enhance understanding of course content. The sum of the aforementioned studies, with the exception of Garrison et al. (1977), provides strong support for this hypothesis. CA appears to have a significant, negative relationship with student achievement.

The claim that CA is negatively related to student achievement, however, can only be made to high school and college students. Conspicuously missing from the developing body of literature on the relationship between CA and student achievement are studies involving elementary- and middle school students. That researchers have neglected these students for research is surprising for two reasons.

First, explanations concerning the development of traitlike CA, such as modeling, reinforcement, and heredity (McCroskey, 1984), suggest that some children may arrive at

the elementary school with levels of CA that may cause them to avoid classroom communications necessary for learning. Some (Daly & Friedrich, 1981; Phillips, 1968; Porter, 1978) have suggested that a child's early school experiences with teachers and peers may increase these levels of CA. Indeed, a study by McCroskey, Andersen, Richmond & Wheeless (1981) revealed that one of the largest increases in self-reported CA occurs between grades 3 and 4. Garrison and Garrison (1979) also observed a steady increase in self-reported CA from grade 1 to 12. Thus, students in elementary school may experience levels of CA that cause them to avoid communications with teachers and peers which may, in turn, affect their level of learning.

Second, research indicates that elementary school teachers may develop negative performance expectations of the high communication apprehensive student (McCroskey & Daly, 1976). A considerable amount of research is available that documents the effects teacher expectations may have on student learning (Levine & Wang, 1983);(Rosenthal & Jacobson, 1968).

Thus, the purpose of the present investigation was to examine the relationship between CA and student achievement among elementary- and middle school students. Since students may enter the elementary school with levels of CA that may cause them to avoid communication with teachers, and since the pattern of behaviors characteristic of the high CA student has been shown to elicit negative performance expectations in elementary school teachers, it was hypothesized that the negative relationship between CA and achievement observed in studies of high school and college students would emerge in a study of elementary- and middle school students. Specifically, the following hypothesis was tested:

> Among elementary- and middle school students, students high in CA will demonstrate lower levels of achievement than students moderate in CA who, in turn, will demonstrate lower levels of achievement than students low in CA.

METHODS

Subjects

Subjects for this study were 1290 elementary- and middle school students in Illinois. The following is a breakdown of the number of students observed at each grade level; K, 124; 1, 113; 3, 93; 4, 93; 5, 106; 6, 115; 7, 267; and 8, 266.

Independent Variable

The independent variable in the present study was communication apprehension (CA). CA was operationally defined as scores on the Measure of Elementary Communication Apprehension (MECA; Garrison & Garrison, 1979). The MECA is composed of twenty Likert-type statements designed to assess a student's level of fear or anxiety associated with communication with others. MECA items are framed in language appropriate for younger children and incorporates a progression of smiling and frowning faces for response options (Garrison & Garrison, 1979). The smiling and frowning faces were dropped from the MECA instrument administered to students in grades 7 and 8; these students responded to each MECA item by circling a word(s) that best represented their feelings (i.e., very happy, somewhat happy, undecided, somewhat unhappy, very unhappy). The scale was orally administered to students in grades K-6 by the students' teachers. Students in grades 7 and 8 completed the scale in their social studies class. All teachers were given detailed, written instructions on administering the MECA instrument.

Three levels of CA were operationally defined in this study. High CA was operationalized as a score greater than one standard deviation above the mean CA score observed in the sample. Moderate CA was defined as a score within one standard deviation above and below the mean CA score. Low CA was defined as a score less than one standard deviation below the mean. See Tables 4, 5, and 6 for means and standard deviations for CA at the grade levels analyzed.

Dependent Variable

The dependent variable in the present study was student achievement. Achievement was operationally defined by scores on nationally-administered, standardized achievement tests. Students in kindergarten completed the Stanford Early Achievement Test (SESAT). This test assessed students' achievement in social studies, environment (science), mathematics, letters and sounds, and oral comprehension.

Students in grade 1 completed the Metropolitan Readiness Test (MRT). This test assessed student's reading, language, auditory, visual and quantitative skills.

In grades 2-8, students completed the Stanford Achievement Test (SAT). The SAT quantified student achievement in reading, language, and mathematics.

National percentile-rank scores were utilized in statistical tests involving students in kindergarten (SESAT) and grades 2-8 (SAT). The national percentile-rank score reflects a student's achievement in relation to every 100 students who took the exam. Raw scores were analyzed in grade 1 where students completed the MRT. In all cases, achievement test scores were obtained froms students' permanent school records.

Procedures

Data collection occurred over a 7 month period. In September, students in grade 1 completed the MRT. In October, students in grades 2-8 completed the SAT. Kindergarten students completed the SESAT in February. In March, all students were administered the MECA.

Data Analysis

Data analysis proceeded as follows. First, the internal reliability of the MECA was assessed. Second, the relationship between CA and grade level was examined to determine if a grade should be treated as a covariate in tests of the hypothesis. Finally, the hypothesis was tested by submitting students' achievement test scores to analysis of variance. Since the three achievement tests utilized were not directly comparable, separate analyses were conducted for students in K (Stanford Early School Achievement Test), grade 1 (Metropolitan Readiness Test), and grades 2-8 (Stanford Achievement Test). Separate single-factor ANOVA's were conducted for each sub-test of the achievement tests administered. Follow-up comparisons were conducted according to the recommendations of Winer (1971). Alpha was set at .05 for all tests of significance.

RESULTS

Reliability of MECA

Table 1 reports internal reliability estimates (Cronbach's alpha) for the MECA for the 9 grade levels examined. Reliability ranged from .71 (kindergarten) to .84 (grade 8). The average reliability of the MECA was .78.

Reliability estimates for the achievement tests were not available.

Preliminary Analyses

Preliminary data analyses revealed that CA increased significantly across grade levels. Table 2 presents the results of the ANOVA of MECA scores for male and female students across the 9 grade levels examined. Table 3 presents descriptive statistics for the

MECA at each grade level. Of particular interest were the CA scores of students in grades 2-8, since these students completed a common achievement test (SAT) and were to be analyzed together in the test of the hypothesis. Figure 1 presents a graph of MECA means by grade level. The correlation between CA and grade level was .29 ($p<.001$) for grades 2 to 8. Thus, in the test of the hypothesis for students in grades 2-8, grade level was treated as a covariate in the analysis of variance.

Primary Results

To test the theoretical hypothesis, separate ANOVA's were conducted for students in kindergarten, grade 1, and grades 2 to 8 since these groups completed different achievement tests making direct comparison across all grade levels impossible.

The ANOVAs conducted on achievement test scores for students in kindergarten are summarized in Table 4. Although the means are in the predicted direction on each of the achievement tests, no ANOVA produced a significant F-ratio. The power (Cohen, 1977) for this test was estimated at .15 for a small effect size, .70 for a medium effect size, and .98 for a large effect size.

The ANOVAs conducted on achievement test scores for students in grade 1 are summarized in Table 5. The ANOVA of the visual discrimination test scores was significant ($F=3.42$, $df=2, 112$, $p.<.036$). Follow-up-tests of differences (Winder, 1971) revealed that low CA students had significantly lower achievement than both high and moderate CA students. The difference between moderate and high CA was not significant. Here, power was estimated at .14 for a small effect size, .66 for a medium effect size, and .97 for a large effect size.

The ANOVAs conducted on achievement test scores for students in grades 2-8 are summarized in Table 6. The ANOVAs of test scores for mathematics achievement ($F=5.98$, $df=2, 1044$, $p<.003$) and reading achievement ($F=5.83$, $df=2, 1044$, $p<.007$) were both significant. Follow-up tests (Winer, 1971) on adjusted scores on the mathematics test and the reading test revealed that both low and moderate CA students had significantly higher achievement test scores than high CA students. The difference between low- and moderate CA students was not significant on either test. Power was estimated at .83 for a small effect size and .99 for both medium and large effect sizes.

DISCUSSION

The present study examined the relationship between communication apprehension (CA) and academic achievement among elementary- and middle school students. It was hypothesized that students high in CA would demonstrate lower academic achievement than students moderate in CA who, in turn, would demonstrate lower academic achievement than students low in CA. CA was expected to have a negative relationship with achievement because students high in CA, compared to those low in CA, will be motivated to avoid classroom communications to avoid experiencing feelings of fear or anxiety. A pattern of communication avoidance will lead to decreased learning since many of the pedagogical devices utilized in schools demand verbal interaction from students.

Since students across the 9 grade levels completed three different achievement tests, separate statistical tests of the hypothesis were conducted for students in kindergarten, grade 1, and grades 2-8. The results of those analyses provided partial support for the hypothesis.

The hypothesis was not supported in analyses of achievement scores for students in kindergarten and grade 1. In kindergarten, the means were in the expected direction on the SESAT. The ANOVA lacked adequate statistical power to detect a small effect size.

In grade 1, only one significant ANOVA was observed and follow-up analyses revealed that students low in CA demonstrated lower levels of learning on the visual matching component of the MRT than students moderate and high in CA. This finding obviously contradicts the hypothesis and is difficult to explain. The visual discrimination test measures a student's skill in matching letters, words, numerals and letter-like forms. As such, the test indexes a child's learning and visual-perceptual skills. The results suggest that students low in CA, while possessing a predisposition to be a good sender of messages, may be relatively poor receivers/perceivers of messages. Additional research is needed that explores such a notion.

Analyses of mathematics and reading achievement test scores for students in grades 2-8 provided support for the hypothesis. Follow-up analyses revealed that, for both mathematics and reading achievement tests, students high in CA had lower achievement than did students low in CA. Furthermore, for both mathematics and reading achievement, the difference between moderate and high CA students was also significant. These findings tend not to support the contention held by some (e.g., Davis & Scott, 1978) that students high in CA achieve at levels comparable to those of students moderate in CA. The present study suggests, however, that students low in CA achieve at levels comparable to students moderate in CA.

Overall, the results suggest that CA may have a negative effect on student learning. Educators of elementary- and middle school students should, therefore, be concerned with establishing methods for treating CA in their classrooms and adopting teaching strategies that minimize the negative effects of CA (McCroskey, 1980). Educators should adopt teaching strategies that encourage students with high CA to approach the teacher when they do not understand course material.

FIGURE 1

Mean Communication Apprehension Scores By Grade Level

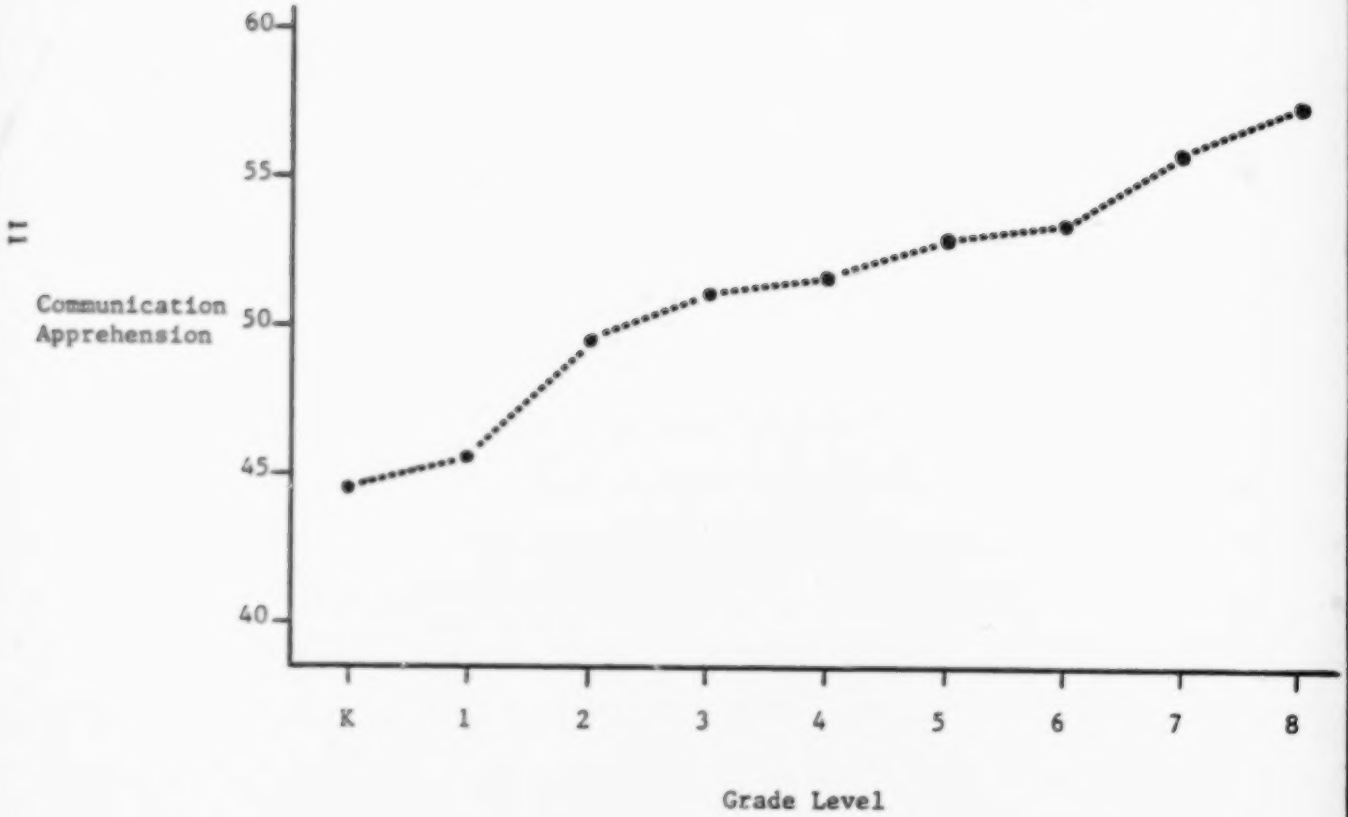

TABLE 1

MECA Reliability

Grade Level	K	1	2	3	4	5	6	7	8
Reliability*	.71	.78	.78	.77	.76	.79	.79	.79	.84
Sample Size	124	113	113	93	93	106	115	267	266

*Cronbach's Alpha

TABLE 2

Summary of the Sex X Grade Level ANOVA of MECA Scores

Source	SS	df	MS	F	p
Grade (G)	2528.72	8	3228.59	35.73	.000
Sex (S)	26.61		26.61	.29	.587
G X S	979.35	9	122.42	1.36	.212
Error	114220.00	1264	90.36		

TABLE 3

Descriptive Statistics for the MECA Across Grade Levels

Grade Level	K	1	2	3	4	5	6	7	8
$\bar{x}$	44.81	45.29	49.51	51.40	51.65	53.12	53.41	56.33	57.74
s	10.23	10.28	9.52	9.78	9.99	8.93	8.84	8.97	9.58
min	20	20	24	22	20	31	31	24	24
max	73	78	73	73	75	80	78	83	81

TABLE 4

Mean Scores, F-Ratios and Effect Sizes for Achievement Variables for Students in Kindergarten (SESAT)

Communication Apprenhension ($\bar{x}$=45, s=10)	Dependent Variables			
	Environment	Letters	Aural	Mathemathics
MEAN SCORES				
Low (n=18)	27.59	32.11	25.06	31.89
Moderate (n=88)	27.00	30.28	27.03	27.38
High (n=18)	17.00	15.55	13.00	17.45
F-RATIOS & ALPHA LEVELS				
	.53	1.10	1.09	.67
	<.588	<.335	<.341	<.513
EFFECT SIZE (ETA SQUARED)				
	.009	.018	.018	.013

TABLE 5

Mean Scores, F-Ratios and Effect Sizes for Achievement Variables fo Student in Grade 1

(Metropolitan Readiness Test)

Communication Apprehension ($\bar{x}$=45, s=19)	Dependent Variables				
	Auditory	Visual	Language	Hearing	Quanitative
Low (n=15)	25.93	19.80[ab]	15.00	60.67	18.20
Moderate (n=85)	26.03	22.58[b]	14.76	63.51	19.03
High (n=13)	24.84	22.39[a]	14.24	61.46	19.00
F-RATIOS & ALPHA LEVELS					
	.58	3.42	.48	1.16	.41
	<.561	<.036	<.666	<.319	<.661
EFFECT SIZE (ETA SQUARED)					
	.017	.060	.029	.021	.008

Note: Means with a common superscript are significantly different.

TABLE 6

Adjusted Mean Scores, F-Ratios and Effect Sizes for Achievement Variables for Students in Grades 2-8 (SAT)

Communication Apprehension ($\bar{x}$=54, s=10)	Dependent Variables		
	Mathematics	Language	Reading
MEAN SCORES			
Low (n=159)	67.14[a]	69.46	69.31[a]
Moderate (n=726)	62.96[b]	68.68	66.76[b]
High (n=160)	56.73[ab]	64.01	60.75[ab]
F-RATIOS & ALPHA LEVELS			
	5.98	2.49	5.03
	<.003	<.083	<.007
EFFECT SIZE (ETA SQUARED)			
	.025	.019	.025

Note: Means with a common superscript are significantly different.

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